

ABSTRACT

A practical bonding technique is provided for solid-phase room-temperature bonding which does not require a profile irregularity of the order of several nanometers, in which a high-vacuum energy wave treatment and continuous high-vacuum bonding are not required.

Since an adhering substance layer is thin immediately after a surface activating treatment using an energy wave, a bonding interface is spread by crushing the adhering substance layer to perform bonding, so that a new surface appears on a bonding surface, and objects to be bonded are bonded together. In order to crush the adhering substance layer more easily, a bonding metal of a bonding portion of the object to be bonded needs to have a low hardness. According to the results of various experiments conducted by the present inventors, it was found that the hardness of the bonding portion which is a Vickers hardness of 200 Hv or less is particularly effective for room-temperature bonding.